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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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ASTRONOMY

Jupiter's Belts Hazardous

THE PLANET Jupiter has a radiation belt much more hazardous for space travelers than the earth's radiation belts, two California Institute of Technology scientists have found.

The radio energy from the Jupiter belt is one hundred trillion times that expected from the earth's belt, calculations have shown. Venkataraman Radhakrishnan of India and Dr. James A. Roberts of Australia, both working currently at the Radio Observatory of the California Institute of Technology, report the extent and polarization of Jupiter's radiation belt in *Physical Review Letters*, 4:493, 1960, official publication of the American Physical Society in New York.

The belt is about 255,000 miles above the surface of the planet, which itself is about 85,000 miles in diameter. Jupiter's radiation at a frequency of 960 megacycles is due to the fact that high speed electrons trapped in the planet's magnetic field emit radio waves as they spin back and forth along the line of magnetic force. This mechanism is known as synchrotron radiation.

Unexpectedly high radio emission from Jupiter at a wavelength of ten centimeters, or slightly less than four inches, was first

detected by scientists at the Naval Research Laboratory, Washington, D. C. Their findings were later confirmed at other short wavelengths both at Caltech and the National Radio Observatory, Green Bank, W. Va. Synchrotron radiation from a belt resembling the earth's was immediately suggested for the origin.

Proof for this mechanism was found in the detection of linear polarization of the radio emission and the region of the emission. Both measurements were possible because of the unique radio antennas erected under the direction of J. G. Bolton, director of Caltech's Radio Observatory in Owens Valley, California.

The radio telescope consists of two 90-foot steerable antennas mounted on a railroad track a third of a mile long. Individually, these antennas are the largest of their type in the United States and second in the world only to the 250-foot dish at Jodrell Bank, England.

For certain observations the two antennas may be used to simulate the effect of a single dish equal in diameter to the distance between them.

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PHYSIOLOGY

Fluid-Filled Sac for Space

A FLUID-FILLED SAC, like those in which unborn babies develop, may make an ideal space capsule, two pathologists, Drs. B. Black-Schaffer and G. T. Hensley of the University of Cincinnati College of Medicine report. They have just completed experiments with mice showing the value of immersion in fluid as a protection against acceleration on blasts off into space.

To simulate conditions found in the serous fluid of the amniotic sac, the protective enclosure in which the unborn baby develops, the researchers chilled baby mice until their heart beats, respiration and metabolism stopped—a state of suspended animation—and immersed them in a briny solution in transparent bags. The mice were then put in a centrifuge that spun them at various speeds.

Writing in *Archives of Pathology*, May, 1960, published by the American Medical Association, the researchers report they found that immersed mice could survive stresses of acceleration that killed other mice, also in a state of suspended animation but not immersed.

Pointing out that the exploration of outer space will require the transit of vast distances over periods of time equivalent to geologic eras, the pathologists state that a possibility exists of circumventing this space-time obstacle. They refer to Einstein's theory which states that with increasing uniform velocity time slows relative to an observer on earth.

The doctors explain that "this property of uniform velocity begins to assume significance for space travel at a speed approximating that of light itself, 186,300 miles a second. With this relative clock measuring the passage of time, man could attempt the exploration of outer space if a means could be found of protecting him against the great forces generated in the short time during which such velocities should be attained."

The experiments are a step toward solving the problem, the researchers claim, in that they proved that mice when immersed are protected against an accelerative stress leading to a constant speed of 14,500 miles a second. They conclude that a constant velocity of this figure would result in a slowing of the space traveler's time relative to that of earth by one percent.

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SURGERY

New Palate Operation Prevents Fuzzy Speech

A NEW SURGICAL technique to close and lengthen a cleft palate in a single, one-hour operation was said to prevent the fuzzy speech patterns that sometimes follow palate operations.

Drs. Richard B. Stark and Clayton R. DeHaan of St. Luke's Hospital in New York City described their new technique at the American Association of Plastic Sur-

geons meeting in Milwaukee, Wis. They said they lengthen the palate by transferring to it a flap of mucous membrane and muscle from the pharynx.

The doctors reported that the flap prevents a leakage of air into nasal passages. This leak, which causes indistinct speech, often follows conventional palate operations in which the cleft palate is closed but not lengthened.

The two surgeons said they have now used the technique on 22 babies. They advised that palate operations should be performed before a child has begun to speak. Early surgery prevents the difficulty of retraining a child to speak. The surgeons said it also may prevent hearing difficulties, a common problem among children with cleft palate.

The two surgeons' palate operation is believed to be the first of its kind. Palate closing and palate lengthening have formerly been separate operations, with the lengthening operation following the closing operation when fuzzy speech resulted.

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MEDICINE

Live Oral Polio Vaccine Proved Safe and Effective

THE DEVELOPER of the Sabin live oral polio vaccine has told scientists that his vaccine has been proved safe and effective in tests with millions of persons, but whether public health authorities will use the vaccine is a question "only the future can answer."

Dr. Albert B. Sabin of the University of Cincinnati said tests on millions of persons in 1958 and 1959 have provided evidence of the vaccine's safety.

He said the test data indicate how programs should be designed to not only eliminate the disease but the virus itself in large parts of the world. Dr. Sabin made his remarks in a speech prepared for the International Conference on Live Polio-virus Vaccines in Moscow.

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VIROLOGY

Viruses Grow Better In Heavy Water Medium

VIRUSES MULTIPLY better in cells grown in heavy water, or deuterium oxide, than they do in cells grown in ordinary water.

Dr. David Kritchevsky of the Wistar Institute, Philadelphia, told a New York Academy of Sciences conference in New York that a weakened polio virus strain, known as the CHAT strain, grows well on monkey kidney cells when the medium contains water that is 40% to 50% deuterium oxide. Where there is no heavy water, the virus does not thrive.

The CHAT virus was also grown on experimental tumor cells, called HeLa cells, Dr. Kritchevsky said. When the water contained 25% deuterium oxide, the virus burst, or the number of viruses emerging from a cell infected by a single virus when the cell bursts open, was five to ten times greater.

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ANTHROPOLOGY

Dental Health Decays

Since developing an over-bite, man has not given his teeth as much wear, but decay has increased. Children of broad-chested parents grow faster.

DENTAL DECAY is caused mainly by two factors: diet—especially carbohydrates, or sugar—and the way man chews his food, an anthropologist reported to the American Association of Physical Anthropologists meeting in Washington, D. C.

Dr. J. Lawrence Angel of the department of anatomy at Jefferson Medical College in Philadelphia, said that from prehistoric to classical times, man used his teeth efficiently and gave his teeth a lot of wear. This is evident from early remains of man.

But, beginning with the Romans, teeth show less wear. Dr. Angel attributed this to better cooked food and to the development of an over-bite in man—the normal type in today's mouth.

In an over-bite the upper front teeth overlap the lower front teeth when the jaws are brought together. Before the de-

velopment of an over-bite, man's upper and lower front teeth came together exactly when the jaws were closed.

Dr. Angel said that of about 1,000 mouths from ancient Greece, he has found two groups that had a very small amount of dental decay.

The first group lived about 1700 to 1500 B.C. and were the bronze-age rulers of Mycenae, an ancient Greek city.

At this same time, however, the common people had very poor teeth, their remains show.

Dr. Angel also found good dental health among the Greeks of the Golden Age, who lived from about 600 to 300 B.C.

After the Greek period, dental decay became more widespread and common through the Roman and the Medieval periods.

Under the Turks, Dr. Angel said, not

only the dental health but also the general health of people degenerated. The Turks introduced the use of sugar instead of honey.

Since that time, the dental health of man has continued to decay. Already in the 19th century, general dental health had decayed to the level we know today.

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Fast-Growing Children

THE CHILDREN of broad-chested parents grow faster and mature earlier physically than children of narrow-chested parents, an anthropologist reported to the meeting of the American Association of Physical Anthropologists in Washington, D. C.

Dr. Stanley M. Garn of Fels Research Institute, Yellow Springs, Ohio, said that the motor behavior, or body movements, of the children of broad-chested parents developed earlier than those of children of narrow-chested parents.

He said the chest measurements used were based on X-rays so that only the bone structure was considered, not the flesh and body fat.

The chest measurements of the parents were taken first, and they were then divided into large and small chest sizes. Only the cases where both parents were either large or small were considered. Next the children of these parents were measured.

The data on the children involved: height, weight, bone development from birth through 17 years, and observation of motor behavior in infancy.

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How To Reduce Radiation

HAND AND FOOT X-rays together show the physician as much about over-all bone growth of a person as if he had the more extensive series of X-rays that have previously been thought necessary, Dr. Stanley M. Garn of Fels Research Institute, Yellow Springs, Ohio, told the meeting of the American Association of Physical Anthropologists in Washington, D. C.

The advantage of taking X-rays of just the hands and feet, in order to determine bone growth of the whole person, is that this involves less radiation exposure of the body.

Dr. Garn said that the X-rays used for this study were collected over a period of years, and consisted both of normal material and of clinical abnormalities from cooperating hospitals.

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Facial Shape Changed

THE PAWNEE and Arikara Plains Indians of historic times have a medium-size head and medium-length face that are alike. They are quite different from Plains Indians of pre-historic times, of the Upper Republican River and the Nebraska cultures. The Pre-historic type had a broader head with a long face, Dr. William M. Bass, of the University of Nebraska reported to the American Association of Physical Anthropologists meeting in Washington, D. C.

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MECHANICAL HAND—A six-ounce mechanical "band" enables persons with paralyzed hands to perform many daily tasks. It is demonstrated by Dr. Arthur J. Heatherer, left, of the Eugene du Pont Memorial Hospital, who invented the "band" under a grant from the Easter Seal Research Foundation. Charles Daniels, right, assisted in designing the device.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Psychologia.—Chimicos face lor plus importante labor in juvente annos, secundo Dr. H. C. Lehman del Universitate Ohio qui basa ille conclusion super un analyse statistic de 44 historias del chimia per autores in Germania, Francia, Italia, Anglaterra, e le Statos Unite. Pro illustrar: Inter le 101 contribuciones al progresso del chimia que es mentionate in 20 del 44 historias o plus, 1% esseva facile per un chimico de plus que 55 annos de etate, 13% a plus que 45, 52% a plus que 35, 95% a plus que 25. Inter le 6.347 contribuciones mentionate in solmente un del historias, 6% esseva facile per chimicos de 65 annos de etate o plus, 17% a plus que 55, 38% a plus que 45, 66% a plus que 35, 94% a plus que 25.

Litteratura Technic.—Un estimation recente assere que le Statos Unite ha currentemente 35.000 scribentes technic, i.e. subiectos qui se occupa professionalmente e exclusivamente de compoñer manuales de directivas, de preparar catalogos de componentes de machineria, e—a generalmente parlar—de satisfacer le enorme requerimientos de papiro in le metabolismo del technologia moderne. On previde que in 1970 le scribentes technic in le Statos Unite va formar un armea de 66.000 individuos.

Radiophonia.—Es in production pro le marina statounitese un receptor-emissor de radiophonia que es satis micro pro esser placiate in le casco de soldatos marin. Le apparato es destinata principalmente al uso in le complexissime manovras de porta-aviones que frequentemente require un efficace intercommunication inter disperse e mobile grupplos de individuos.

Energia Atomic.—Pro "lavar" instrumentos e vestimentos e omne altere genere de objecto que ha esseste contaminare per precipitato radioactive, varie detergents ha esseste desvelopate, incluse un—currentemente le plus promittente—que in teste con un sal de cerium-144 applicate a un superficie de aluminium reducva le radioactivitate intra 15 minutus a 0,5%.

Mineria.—Experimentos facite in Pennsylvania ha demonstrate le practicabilitate de minar carbon bituminoso sin le uso de foratores conventional. Illos esseera reimplaciate per jectos de aqua attaccante le carbon con le fortia de un pression de 272 atmospheres.

Psychologia.—Reporta Drs. R. A. Moore e T. C. Murphy del Universitate Michigan un studio del destino post-therapeutic de 100 ex-soldatos tractate pro alcoholismo. Tres annos e medie post lor dimission ab le hospital, 14 esseva considerablemente meliorate, 21 esseva meliorate un pauc, 33 esseva non meliorate, 7 esseva in altere hospitales, 7 esseva morte, 9 esseva in prisiones, e 9 non esseva trovabile. Le resultatо es triste. Drs. Moore e Murphy opinia que le plus grande obstaculo al successoso therapya de alcoholismo es le facto que multe alcoholicos non pote admitter (a se mesme e a alteres) que illes es malade e require adjuta.

Lacteria.—Utilisante le facto que proteinas es fluorescente sub lumine ultraviolette, duo russos ha inventate un proteinometro que lega le contento proteinic de lacte con un precision de intra 0,1 pro cento. Le fluorescencia del proteinas es registrate electronicamente.

Rocchetteria.—Ingenieros del corporation Bell Helicopter proponete le addition de rotorez al prime section de rochettas plurisectional pro permetter lor intacte retorno al terra e mesmo—per medio de dispositivos de teledirection—al sito de lanceamento. Rochetas con re-usable motores de lanceamento esseera un grande economia.

Genetica.—Le caso de un puerco con 69

chromosomas in le cellululas de su corpore es reportate per le Instituto de Genetica Medical del Universitate Uppsala in Sveda. Humanos ha normalmente 46 chromosomas, 23 ab le patre e 23 ab le matre. Pro humanos, 46 es "diploide." Le caso reportate ab Uppsala es le prime reporte de "triploidia" in un infante human. Illo esseva associate con anomalitates cerebral e in le parte superior del corpore.

Primatologia.—Un colonia de 400 macacas del specie rhesus va ocupar un "sede rural" de 66 hectares in le vicinitate de Portland, Oregon. Le installation costara quasi duo millions dollars e va esser dedicate al studio de omne aspectos del physiologia, psychologia, e biologia in general del primates subhuman.

Biophysica.—Oleo vegetal, injicite in muses in quantitates de un trentesimo de lor peso corpore total, protege los contra le effectos de irradiation ionisante, secundo experimentos reportate per Dr. J. K. Ashikawa del Universitate California. Con leve grados de irradiation, sufficiente a destruir 55 pro cento del muses de controlo, le injection de oleo resultava in un superviventia de 90 pro cento. Post irradiation satis forte pro destruir omne le muses de controlo, septe pro cento del muses tractate superviveva. Le mechanismo del efecto protector de oleo es ancora obscur.

Sericultura.—Dr. E. G. Afrikian de Armenia in le U.R.S.S. reporta que vermes de seta producere un fibra superior quando lor alimento—folios de mora—es tractate con un antibiotico.

Cardiologia.—Circa 30 a 40 milles infantes con congenite defectos cardiac nascet omne anno in le Statos Unite. Hodie le chirurgia cardiac es satis avantage pro corrigere ille defectos in 80 pro cento del casos.

Ophthalmologia.—In un experimento conducte al Universitate Indiana, un numero de juveniles myopic essa providede con le combination de berilllos pro un oculo e lentes a contacto pro le altere. Le objectiveo del experimento es verificar le these que lentes a contacto—per contrasto con berilllos conventional—servi non solmente a compensar le existente defecto del vision sed es de facta capace a arrestar su desveloppamento futur.

Radar.—Le armea statounitese ha annunciate le elaboration de un apparato de "radarophotographia" que produce multo detallate photographies de distantissime terrenos. Le producto final ha le apparetta de un aero-photographia conventional. Le apparato mesme ha un peso de 700 libras. Illo es installate sub le fusellage del avion de recognoscencia e collige su information in un forma que require subsequentemente un specific (e secreto) processage pro le desveloppamento de un intelligible imagine. Le novo sistema functiona durante le die e durante le nocte. Illo rende superflue multe formas de spionage conventional, proque illo face su registrations sin que le avion invade le territorio de altere nations.

Physica Atomic.—Recercatores al Universitate California reporta inexpectamente complexe detalios con respecto al contamination de plantas per precipitatos radioactive. Il pare que iste contamination differe (1) inter diverse partes del plantas, (2) inter diverse species, e (3) inter diverse elementos. Per exemplo, folios pare contaminarse plus facilmente que fructos e semenes. Fabas es contaminante plus facilmente que lactuca. E strontium es le elemento radioactive le plus aggressive, multo plus aggressive que iodo, barium, e cesium, e le contamination de plantas per yttrium e certe altere elementos es praticamente negligibile.

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GENERAL SCIENCE

Reading Interlingua

YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you never had contact with any foreign language.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

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GENERAL SCIENCE

Science Fair Winners

Four young scientists share top honors in the 11th National Science Fair-International. The winners come from Canada, Texas, New Jersey and Connecticut.

See Front Cover

NATIONAL SCIENCE Fair-International awards were presented at a banquet in Indianapolis, Ind., honoring all of the 356 finalists and their teachers.

The outstanding projects from 193 regional and area fairs in 44 states, the District of Columbia, Puerto Rico, Germany, France, Italy, Japan, Canada and Thailand were judged by 186 scientific specialists. Top winners among the finalists were announced by Watson Davis, director of SCIENCE SERVICE, which conducts the annual fair. A view of this year's exhibits is seen on the cover of this week's SCIENCE News Letter (See also SNL, 77:326, 327, May 21, 1960).

First Place Awards in the biological sciences division went to Susan Brown, 16, Stephen F. Austin H.S., Austin, Texas, for her project, "A Root Growth Factor from Seedlings," and to Gary N. A. Botting, 16, Peterborough Collegiate and Vocational School, Peterborough, Ontario, Canada, for his study of "Interesting Variations of the Cynthia Silk Moth."

In the physical sciences division, First Place Award winners were Mavis Ilene Atkinson, 18, Watchung Hills Regional H.S., Plainfield, N. J., for her exhibit on "Nature's Color Carpet," and to Donald F. Carpenter, 16, William Hall H.S., West

Hartford, Conn., for his work on the "Aerodynamics and Thermodynamics of a Counterflow Vortex Tube." He also received a National Navy Science Cruiser award, an Army Science Award, and the Air Force Aerospace Dynamics Award. First Place winners will receive "Wish Awards" of \$125 of scientific equipment or books of their own choice.

Presentation of the awards followed a talk by Dr. Paul A. Siple, Scientific Adviser, Army Research Office, and president, Association of American Geographers.

Second Honors and \$75 Wish Awards were given to: Kathleen Anne Higgins, 17, Lourdes Academy, Cleveland, Ohio, "Carbohydrate Metabolism Pathways in *Pseudomonas G4A*"; Joan Wallace, 15, Roosevelt H.S., Des Moines, Iowa, "Hatchability by Germinal Disc Observation"; Shannon Wells, 17, Bethany H.S., Bethany, Okla., "A Study of Cancer and the Inhibitive Substance and Their Relationship to Each Other"; Robert Herman Baum, 18, Melbourne H.S., Melbourne, Fla., "Studies of DNA and Mutants of the Mold Neurospora"; David Hou-Cheung Chen, 18, Bethesda-Chevy Chase H.S., Bethesda, Md., "Juvenile Hormone in Lepidoptera and Calf Thymus—Its Isolation and Bioassays"; Murray P. Hamlet, 17, Valley City H.S., Valley City, N. Dak., "Avian Air Sacs"; Lester Martin Partlow, 17, Fairfax H.S.,



GARY N. A. BOTTING—He studied the *Cynthia* silk moth.

Fairfax, Va., "The Orientation of *Euglena gracilis*"; Junko Sugimori, 18, Aisen H.S., Sakaishi, Osakafu, Japan, "Systematic Quantitative Analysis of Metal Ions by Titration"; Joe Dan Bourland, 18, Pampa Senior H.S., Pampa, Texas, "The Effect of Impurities on the Photoemission Properties of Zinc Sulfide Electroluminescent Phosphors"; James Kirk Bramblett, 17, Jefferson H.S., Lafayette, Ind., "Ultraviolet Flying Spot Microscope"; William Edward Jones, 18, Abilene H.S., Abilene, Texas, "A Study of Digital Computers"; Donald Campbell Shapero, 18, Cubberly Senior H.S., Palo Alto, Calif., "Proton-Free Precession Magnetometry"; David Joel Wilson, Jr., 18, Athens H.S., Athens, Ala., "Survival on Mars"; Eldred Houch Wiser, 17, Central H.S., Murfreesboro, Tenn., "Chemical Reactions in Silicic Acid Gel."

Third Place Awards and \$50 Wishes went to: Karen Orton Hodges, 16, Alamo Heights H.S., San Antonio, Texas, "Exploring Tidewater"; Judith McHale, 16, Saint Francis Academy, Bethlehem, Pa., "The Effects of Color and Light on Brine Shrimp"; Edith Katherine Schuele, 16, Treadwell H.S., Memphis, Tenn., "Algae—Food of the Future"; Fredrick Anthony Dombrose, 15, Okemos H.S., Okemos, Mich., "Comparative Anatomy of the Eye"; Marc Garry Roth, 14, Framingham H.S., Framingham, Mass., "Variation and Speciation of New England Butterflies"; Wayne Lee Settle, 17, Portland-Wayne Township Senior H.S., Portland, Ind., "Mutations in German Millet Induced by Gamma Radiation"; Barry G. Vesper, 16, College H.S., Bartlesville, Okla., "Effect of Positive G Forces on Pulse and Respiration of the Rat"; Jane Marie Bader, 17, Iowa City H.S., Iowa City, Iowa, "Effect of Ultraviolet Light on CCl_4 , I, and Selected Olefins"; Margaret E. Kottke, 17, Bladensburg Senior H.S., Bladensburg, Md., "Sugar-Boron Complexes"; James Harold Collins, 17, Central H.S., Evansville, Ind., "The Bubble Chamber—A Device Used to Study Subatomic Particles"; Gay Leon Dybwad, 18,



FIRST PLACE WINNERS—Four proud National Science Fair-International top award winners beam after banquet announcement that they are the cream of the crop. From left to right: Gary N. A. Botting, Mavis Ilene Atkinson, Susan Brown, and Donald F. Carpenter.

Central H.S., Grand Forks, N. Dak., "Spectroscopic Experiments with Densitometer Comparisons"; William Hugh Mann, 17, Idaho Falls Senior H.S., Idaho Falls, Idaho, "A New Concept in Color Television"; David Crosby Milne, 16, Will C. Crawford H.S., San Diego, Calif., "Automatic Electronic English-to-Braille Translator"; William King Rich, 16, Highland H.S., Salt Lake City, Utah, "Abundance of the Elements"; Irving J. Spitzberg, Jr., 18, Hall H.S., Little Rock, Ark., "The Inversion of Sucrose in Alcohol-Water Solvents."

Fourth Awards of \$25 Wishes were given to:

ALABAMA—Omer Lee Burnett, Jr., 16, Sylacauga H.S., Sylacauga.

ALASKA—Jack Denny Griffith, 18, Anchorage H.S., Anchorage.

ARIZONA—Jarel B. Hambenne, 17, Catalina H.S., Tucson.

ARKANSAS—Barbara Sue Friend, 17, Mena H.S., Mena.

CALIFORNIA—Belmont Frisbee, Jr., 17, Burroughs H.S., Ridgecrest; Russell Lowell Morgen, 17, Tracy H.S., Tracy; Todd Gilmore, Jr., 18, Palm Springs H.S., Palm Springs; Harriet Lynn Pryor, 17, Colton Union H.S., Colton; Alysa Kathryn Dees, 16, Norte Del Rio Senior H.S., North Sacramento; Margaret Clare Martin, 17, El Cerrito H.S., El Cerrito.

COLORADO—Douglas Howell Chessen, 16, East H.S., Denver; Martin J. Murphy, Jr., 17, Abbey School, Canon City.

DELAWARE—Jonathan Seville Bragdon, 15, Henry C. Conrad Sr. H.S., Wilmington; Charles Joseph Twardowski, 17, Brown Vocational H.S., Wilmington.

FLORIDA—Judy Anne Vary, 16, Manatee H.S., Bradenton; Sheila Marie Most, 15, Boca Ciega Senior H.S., Gulfport; Roman Stuart Ohnemus, 17, Leon H.S., Tallahassee.

FRANCE—Lucy McCartan, 17, Verdun American H.S., Verdun.

GEORGIA—John Bryan Kethley, 17, Decatur H.S., Decatur; James Michael Hosford, 17, Northside H.S., Atlanta; Douglas Rumble III, 17, Henry Grady H.S., Atlanta.

IDAHO—Richard Bingham, 17, Blackfoot H.S., Blackfoot; Eldon S. Kearn, 17, Fielding H.S., Paris; Mary Bernice Robison, 15, Roberts H.S., Roberts.

ILLINOIS—Barry Ronald Dworkin, 16, Amundsen Senior H.S., Chicago; Douglas Randolph Thornton, 17, Taft H.S., Chicago.

INDIANA—Judy Ann Edwards, 18, Columbus Senior H.S., Columbus; John Dewood David, 17, Benjamin Bosse H.S., Evansville; Larry Wayne Kramer, 18, North Side H.S., Fort Wayne; Alice Margaret Koch, 17, Garfield H.S., Terre Haute; John Thane Bartlett, 15, Rochester Joint H.S., Rochester; Ronald Charles Carlson, 18, LaPorte H.S., LaPorte; Kara Elene Wike, 17, Isaac C. Elston Sr. H.S., Michigan City.

IOWA—Jerry Foote, 17, Bettendorf H.S., Bettendorf; Bryce Anthony Ecklein, 16, Cedar Falls H.S., Cedar Falls; Mary Sue Wilson, 16, Malcolm Price Laboratory School, Cedar Falls; James Philip Robbie, 17, Iowa City H.S., Iowa City.

JAPAN—Akira Kamo, 17, Toin H.S., Wakayamashi.

KANSAS—Patricia Anne Keating, 17, Luckey H.S., Manhattan.

LOUISIANA—Ronnie Rambin, 18, Fair Park H.S., Shreveport.

MARYLAND—William A. Burslem, Jr., 16, Northwestern H.S., Hyattsville.

MICHIGAN—Jim Colando, 17, Pontiac Central H.S., Pontiac; Susan Lynn Smith, 17, Ottawa Hills H.S., Grand Rapids.

MINNESOTA—Kent B. Crossley, 17, Faribault Sr. H.S., Faribault.

MISSISSIPPI—George Alexander Everett, Jr., 17, Greenwood H.S., Greenwood.

MISSOURI—George Barisas, 14, Southeast H.S., Kansas City; Claudia Reed Shepard, 18, Central H.S., Kansas City; Diana Lee Maxwell, 17, Jennings Senior H.S., Jennings.

NEW JERSEY—Barbara J. R. Jones, 17, Jonathan Dayton Regional H.S., Springfield.

NEW MEXICO—Wesley H. Smith, 16, Valley H.S., Albuquerque.

NEW YORK—Emerita Marie Caputo, 17, Aquinas H.S., New York; Marvin Kent Hutt, 16, Jamaica H.S., New York; Philip J. Friedman, 16, Lincoln H.S., Yonkers.

NORTH CAROLINA—Laura Russell Livingston, 17, Myers Park H.S., Charlotte; Charles Lee Kling, 17, Washington H.S., Washington.

OHIO—Donna Gene Hayes, 16, Woodward H.S., Toledo; John Janis Bungs, 18, Thomas W. Harvey H.S., Painesville.

OKLAHOMA—Cara Mitchell, 18, Kingfisher H.S., Kingfisher.

PENNSYLVANIA—Melvin Alan Snyder, 17, Easton H.S., Easton; Eugene Louis DiVeglia, Jr., 17, Central Dauphin H.S., Harrisburg; Karen C. Silver, 16, William Penn H.S., Harrisburg; Robert Edward Humphreys, 17, A. D. Eisenhower Senior H.S., Norristown; George F. Post, 17, Reading Central Catholic H.S., Reading; Barbara Jane Dymond, 16, Benton Township H.S., Fleetville; W. James Prowse, 17, Clarks Summit-Abington H.S., Clarks Summit.



DONALD F. CARPENTER—He worked on aerodynamics and thermodynamics.



MAVIS ILENE ATKINSON—She exhibited colors from nature.

RHODE ISLAND—Donald Francis Kearney, 17, Warwick Veterans Memorial H.S., Warwick; Stephen Ernest Silverman, 17, Classical H.S., Providence.

SOUTH CAROLINA—James Gustave Speth, Jr., 18, Orangeburg H.S., Orangeburg.

SOUTH DAKOTA—Merrill Conklin, Jr., 18, Rapid City H.S., Rapid City; Douglas Lee Franzen, 17, Washington Senior H.S., Sioux Falls.

TENNESSEE—Norma Jean Ayers, 17, Powell H.S., Powell; James Madison Foster, Jr., 19, East H.S., Memphis.

TEXAS—Martha Catherine Moon, 17, San Angelo Central H.S., San Angelo; Robert Slater Parkinson, 17, Woodrow Wilson H.S., Dallas; William Robert Richerson, 18, Arlington Heights H.S., Fort Worth; David Berwick Vinson III, 16, Mirabeau B. Lamar H.S., Houston; Timothy Coit Mock, 17, Wichita Falls Senior H.S., Wichita Falls; Ann Shelton, 18, Knox City H.S., Knox City.

VIRGINIA—Richard Newell Boyd, 17, Washington-Lee H.S., Arlington; Warren Douglas Drumheller, 17, William Fleming H.S., Roanoke; Ruth Ann Ziegler, 15, William Fleming H.S., Roanoke; Peter Howarth Henry, 17, Warwick H.S., Newport News.

WASHINGTON—Thomas Franklin Stinson, 17, Puyallup H.S., Puyallup.

WEST VIRGINIA—George Robert Harper, 17, St. Albans H.S., St. Albans; Ralph Lawrence Stenger, Jr., 18, Central Catholic H.S., Wheeling.

WISCONSIN—William E. Schoknecht, 17, Rufus King H.S., Milwaukee.

Special Awards

American Chemical Society presented First Awards of plaques and \$100 for purchase of materials to further winners' study and experimentation to Kathleen Anne Higgins, 17, Lourdes Academy, Cleveland, Ohio, "Carbohydrate Metabolism Pathways in *Pseudomonas G4A*" and to Robert Edward Humphreys, 17, A. D. Eisenhower Sr., H.S., Norristown, Pa., "An Investigation on page 351)

GENERAL SCIENCE

Second Honors in Health

IN ADDITION to top awards made at the Health Awards Banquet of the National Science Fair-International (see SNL, 77:327, May 21, 1960), American Medical Association Honorable Mention citations were given to Norma Jean Ayers, 17, Powell H.S., Powell, Tenn., for "Antibodies" and to Richard Komorowski, 17, Notre Dame H.S., Milwaukee, Wis., for "Cancer Immunization."

American Dental Association second honors, certificates of Meritorious Achievement and \$50 gift certificates for scientific equipment, were presented to Mary Sue Wilson, 16, a top ADA winner last year, Malcolm Price Laboratory School, Cedar Falls, Iowa, "Mutational Origin of Bacterial Resistance to Antibiotics" and to Alan Paul Bloebaum, 18, A. N. McCallum H.S., Austin, Tex., for "Effect of Sugars in Popular Carbonated Beverages on the Growth of *Lactobacillus acidophilus* in Saliva."

The American Veterinary Medical Association Honorable Mention citation plaque was given to Fredrick Anthony Dombrose, 15, Okemos H.S., Okemos, Mich., for "Comparative Anatomy of the Eye." He is alternate for the AVMA meeting.

The second American Pharmaceutical Association Award, a plaque, was given to Miss Shannon Wells, 17, Bethany H.S., Bethany, Okla., for "A Study of Cancer and the Inhibitive Substance and Their Relationship to Each Other."

Presentations of the awards were made on behalf of the American Medical Associa-

tion by Dr. Carl L. Lincke, chairman of the judges, and chairman of AMA's Council on Scientific Assembly; for the American Dental Association by Dr. Maynard K. Hine, dean, School of Dentistry, University of Indiana; for the American Veterinary Medical Association, Dr. C. Roger Smith, College of Veterinary Medicine, Ohio State University; and for the American Pharmaceutical Association by Dr. Howard C. Newton, president of the APhA and dean of the Massachusetts College of Pharmacy in Boston.

Announcement of the awards followed a talk by Dr. John Furbay, writer and guest lecturer for the Institute of World Trade and for the Strategic Intelligence School in Washington, D. C.

Science News Letter, May 28, 1960

Medicine Career Choice

MORE THAN ONE-FIFTH of the 356 promising young scientists who were finalists at the 11th National Science Fair-International look forward to professional careers in the medical sciences.

According to study made by SCIENCE SERVICE, which conducts the annual event, most of these medically-minded students plan on medical research or practice in various medical specialties. Fifteen of them want to enter such associated fields as veterinary medicine, nursing, medical technology, pharmacy and psychology.

Physics claims the interest of 13% of the finalists, with engineering close behind with 12%. The biological sciences are the choice of 10%.

"Science" or "research" in unspecified fields appeals to 8% of these sophomores, juniors, and seniors, many of whom have not yet had basic high school courses in the various sciences.

Chemistry appeals to 7.6%, and science or mathematics teaching to 6%.

Only 6% remain undecided about their career goals or believe they will enter non-science professions. Non-science choices include such fields as law, political science, linguistics, and missionary work.

Science News Letter, May 28, 1960

President's Greetings

"It is a pleasure to send greetings to those attending the eleventh National Science Fair-International.

"The constructive creativity of the young scientists and educators represented here gives assurance of continuing progress in the field of science. I am delighted to extend my congratulations to them and to their sponsors in the Science Clubs of America. Best wishes for a fine and stimulating fair."

DWIGHT D. EISENHOWER.
Science News Letter, May 28, 1960

Congratulations

"To the young scientists, and their teachers assembled at the eleventh National Science Fair-International and to the many hundreds in the home communities who have given their time and energies in support of your research, I extend congratulations. Your creative endeavors are symbolic of the abilities and skills our country will need in the scientific and technological era that is facing us."

L. G. DERTHICK,
Commissioner of Education,
Office of Education,
Washington, D. C.
Science News Letter, May 28, 1960

Albuquerque Wins 1963

THE 1963 NATIONAL Science Fair-International will be held the second week in May at Albuquerque, N. M., the Science Fair Council recommended. The recommendation was later affirmed by SCIENCE SERVICE which conducts the National Science Fair.

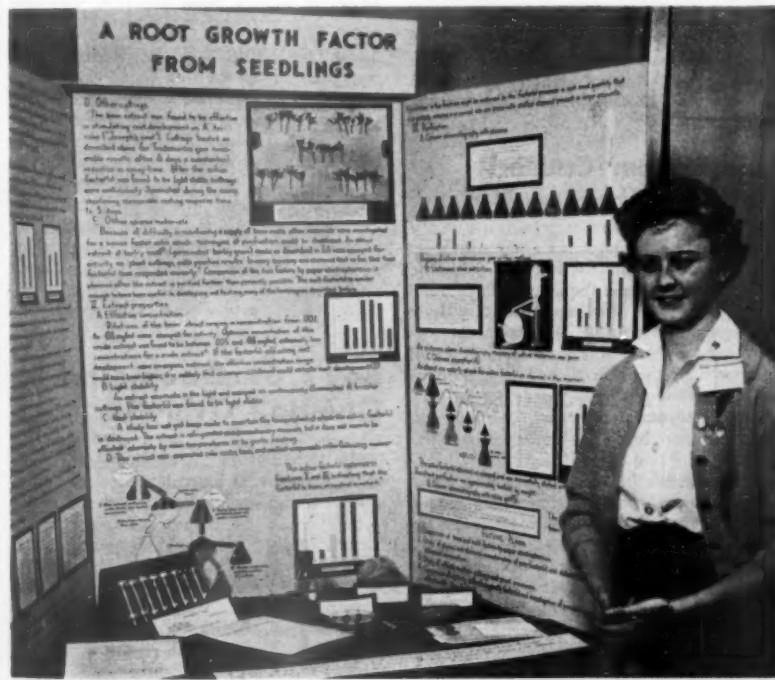
Dr. Burrell Wood of New Mexico Institute of Mining and Technology and science fair director in New Mexico said the fair will be held at the New Mexico State Fair Coliseum.

Sponsors of the fair will be the Albuquerque Journal and New Mexico Institute of Mining and Technology.

The coliseum has more than 70,000 square feet of floor space which will be devoted to exhibit space.

National Science Fair-International will be held in May 1961 at Kansas City and in May 1962 it will be held in Seattle in connection with the Century 21 Exposition.

Science News Letter, May 28, 1960



SUSAN BROWN—She showed a root-growth factor in seedlings.

ENTOMOLOGY

Warbling Tells When Bees Are About to Swarm

THE WARBLING of bees in a hive can be used to predict when the colony will swarm some 15 to 25 days before the actual swarming, an English scientist has found.

E. F. Woods of Surrey, England, has developed a method for electronic prediction of swarming in bees based on the sounds they emit. Normal bee sounds range from 100 to 600 cycles per second, within the range of human hearing.

Mr. Woods found that a warble in the range of 225 to 285 cycles per second and a drop of 10 decibels from normal daytime intensity of the sound signaled the approach of swarming. These changes can be detected by electronic means and used to predict future swarming, according to a report in the *Journal of the Acoustical Society of America*, 32:518, 1960.

The device developed and patented by Mr. Woods to do this job is the "Apidictor." There are some 10,000,000 colonies of bees throughout the world, more than half of them in the United States. One method now used to predict imminent swarming is to examine each hive about every ten days from mid-April to mid-July for signs of queen cells.

Science News Letter, May 28, 1960

MEDICINE

Some Tranquilizers May Destroy Animal Tumors

SOME TRANQUILIZERS have been found to increase the blood's natural ability to destroy animal tumors in test-tube experiments.

Dr. Paul Fluss of the Institute of Applied Biology told the American Chemical Society in New York that animal blood serum treated with tranquilizers Compazine and Frenquel halted the growth of ascites (liquid) tumors that had been removed from test animals.

When the treated ascites cells were transplanted into test mice, the mice "seemed to have lost their ability to produce tumors," he said. Untreated cells on the other hand, induced cancer in the animals.

Certain other chemicals, including sugars and urea, seem to decrease the serum's cancer-destroying ability, Dr. Fluss said.

Science News Letter, May 28, 1960

MEDICINE

Too Much Inactivity Bad for Heart Patients

THE STRESS of daily living, now under question as a possible factor in heart disease, may be less harmful to heart patients than enforced inactivity, three New Jersey researchers believe.

Once a cardiac lesion has healed, rest and inactivity do not prolong life. Too much rest is likely to lead to physical and emotional incapacity, Drs. Marvin C. Becker

SCIENCE NEWS LETTER for May 28, 1960

and Jerome G. Kaufman of Beth Israel Hospital, Newark, N. J., and Wayne Vasey of Rutgers the State University, New Brunswick, N. J., reports in *Circulation*, current issue. The 10,000,000 Americans now afflicted with heart disease will impose a staggering economic burden upon their families and upon Governmental aid funds, unless they can support themselves.

In many cases, the doctors noted, the heart patient's physical problems are more readily solved than the psychological difficulties. The family may be overprotective; the employer may be reluctant to hire the recovered patient, and the community in general may look upon such a person as an invalid. Over-dramatic TV programs and news stories, plus "too restrictive medical counsel," tend to make the patient believe he is more disabled than he really is. This attitude can hinder the patient's recovery.

The doctors conclude that the national economy cannot afford to cross nearly 10,000,000 heart patients off the work list. To prevent such an occurrence, they call for further "education of the public, labor, management, and the physician" in the new concepts of rehabilitation.

Science News Letter, May 28, 1960

BIOLOGY

3-D Microscope Designed For Biological Research

AN IMPROVEMENT over the conventional stereoscopic microscope has been designed by a team led by Richard Gregory at the Cambridge University Psychological Laboratory. The new 3-D microscope produces a solid looking image and will be displayed for the first time May 23 at the Instruments, Electronics and Automation Exhibition at Olympia, England. Intended for use in biological research, it was made possible by a grant from the Department of Scientific and Industrial Research in London.

Science News Letter, May 28, 1960

Dermatology

Skin Cancer Caused By Razor Shaving Nicks

A SINGLE RAZOR CUT may result in skin cancer within a month, Dr. Edmund F. Finnerty Jr. of Tufts University Medical School reported to the Pan American Medical Association meeting in Mexico City.

"We have been able to isolate cases of carcinoma of the skin that were caused by a single razor cut. In each case the carcinoma appeared at the exact site of the cut that did not heal but crusted over repeatedly," he said.

Dr. Finnerty said skin cancer is now about 10 times more common than lung cancer.

Each of the 3,500 dermatologists in the United States is now removing about 100 to 200 skin cancers a year, and surgeons and general practitioners are removing hundreds of thousands annually.

For his report, Dr. Finnerty surveyed members of the North American Clinical Dermatologic Society, of which he is secretary.

Science News Letter, May 28, 1960

IN SCIENCE

SURGERY

Clots in Blood Vessels Found Through X-Ray

TWO PHYSICIANS have located clots in the blood vessels of animals' lungs by X-ray and removed them by surgery. This may point to similar techniques for humans.

Dr. William S. Stoney of Vanderbilt University School of Medicine in Nashville, Tenn., described the procedure at the annual meeting of the National Tuberculosis Association and the American Trudeau Society in Los Angeles, Calif.

Pulmonary embolism, resulting from a floating clot, has caused many deaths because it shuts off the flow of blood in a vessel too small to allow its passage. Although only animals have been used so far, the technique of pinpointing clots may be applicable to human beings.

A chemical is injected into the external jugular vein, after which X-ray shows the embolus, or clot, in the circulatory system. Surgical removal before the blood flow is cut off has been successful in 50% of the operations on animals, Dr. Stoney said.

Co-author of the paper was Dr. Jesse E. Adams, also of Vanderbilt University.

Science News Letter, May 28, 1960

PUBLIC HEALTH

Many Children Under 5 Have Had No Polio Shots

NINETEEN PERCENT of children under five years of age in this country have had no polio vaccine, and 42% of all children in that age group have had less than the three or more shots required. In releasing these estimates, the Public Health Service said that 43% of all paralytic polio cases last year occurred among children under five. Dr. John D. Porterfield, Acting Surgeon General of PHS, warned that paralytic polio will take its heaviest toll this summer among the unvaccinated.

Science News Letter, May 28, 1960

GENETICS

Boy's 69 Chromosomes One-Half Over Normal

THE INSTITUTE of Medical Genetics of the University of Uppsala, Sweden, has reported finding a boy with 69 chromosomes—half again as many as normal. The chromosomes were found in the skin cells of a one-year-old boy who had symptoms of disease in the brain and in the upper part of his body. People usually have 46 chromosomes, 23 from each parent. Geneticists at the Institute believe this is the first time a human triploid, three times 23, has been reported.

Science News Letter, May 28, 1960

NE FIELDS

MEDICINE

Cigarette Smoking Reduces Lung Power

THE COACH is right, athletes. Smoking reduces lung and breathing capacity, a study, partly supported by the National Heart Institute, Bethesda, Md., shows.

The study indicates certain irritants produced by smoking can lead to chronic infection and permanent damage to the lungs. The researchers conclude that lungs are probably physically changed by smoking.

The study was made in Dallas, Tex., by Dr. Russell H. Wilson and Dr. Robert S. Meador, both of the University of Texas Southwestern Medical School, and Bruce E. Jay and Evelyn Higgins, both of the Veterans Administration Hospital, Dallas. They are reporting details in the New England Journal of Medicine, 262:956, 1960.

They studied 14 smokers and 14 nonsmokers. These persons were selected from similar backgrounds. They had no significant differences in physical appearance, age or history of disease. The only significant difference reported by the researchers is that one group had smoked a pack or more of cigarettes daily for an average of 18 years and the other group had not smoked at all.

Science News Letter, May 28, 1960

MINING

14-Month Fire War In Mine Described

THE BATTLE against a coal mine fire at Raton, N. M., cost \$750,000, 3,480 man-hours and much effort. It lasted 14 months.

W. K. Dennison Jr., a superintendent for the Kaiser Steel Corp., described the fight at the American Mining Congress in Pittsburgh, Pa. First, he said, air had to be sealed away from the mine fire. Still an estimated 28,000,000 cubic feet of air remained behind the seals.

So 1,300 tons of dry ice was used to produce carbon dioxide to try to smother the fire. Then the air seals were slowly moved toward the fire. Crewmen had to have their own air supplies and lifelines to prevent their being lost in the smoke.

The fire area was then flooded. The area is still sealed from the rest of the mine. The fire area was confined to an area about 400 by 600 feet.

Science News Letter, May 28, 1960

MEDICINE

Staph Carried Home By Newborn Babies

INFANTS IN A HOSPITAL nursery during an outbreak of staphylococcal disease may not immediately fall sick but have a strong chance of becoming ill after they have been taken home. These infant carriers

may also infect their parents and brothers and sisters.

These are the conclusions of Drs. Valerie Hurst and Moses Grossman, faculty members at the University of California Medical Center, San Francisco, who report their work in the New England Journal of Medicine, 262:951, 1960.

The study was made 16 months after impetigo, caused by a type of staph that resisted antibiotics, broke out in the Center's nursery. Drs. Hurst and Grossman studied 94 families with infants that had been exposed to the impetigo outbreak. They found that 65% of the families had members who had become carriers of staph or had experienced a staph disease.

Only about half of the babies found to be carriers at the time of the home visit were known to have had the disease strain while in the nursery. Forty-four percent of them had developed staphylococcal disease weeks or even months after discharge from the hospital. Of their 164 brothers and sisters, 12% had experience with disease—19 had boils. Ten of the fathers had contracted carbuncles, abscesses or recurrent boils that appeared to be caused by the nursery infection. Twenty of the mothers had similar experiences.

Science News Letter, May 28, 1960

METEOROLOGY

Unusual Pressure Rise Recorded in Alaska

A SPECTACULAR pressure rise that occurred during a three-hour period at Yakutat, Alaska, on Dec. 18, 1959, has been reported to the U. S. Weather Bureau.

It may be the "greatest hourly surface pressure rise" not associated with a tropical storm or hurricane ever found, Mac A. Emerson of the Weather Bureau's Anchorage office reports in the Monthly Weather Review, 88:18, 1960.

The pressure rise was from 29.30 inches of mercury at 10:55 a.m. Alaskan Standard Time on Dec. 18 to 29.575 inches of mercury three hours later. Yakutat is on the Gulf of Alaska.

The sharp pressure increase was associated with a storm system centered 175 miles west of Annette, Alaska. Meteorologists measure pressures of large air masses in inches of mercury. The standard pressure for mean sea level is 29.92 inches.

Science News Letter, May 28, 1960

PUBLIC HEALTH

Tranquilizers Not For "Lift"

THE DISCOVERER of the tranquilizer Miltown, Dr. Frank M. Berger, president of Wallace Laboratories, told the Brooklyn College of Pharmacy's public health forum in New York that people looking for a lift should not take tranquilizers. In spite of popular opinion, patients feel much worse after taking tranquilizers than before, Dr. Berger said. He added that tranquilizers are useful in treating certain mental illnesses but they are not "happy pills."

Science News Letter, May 28, 1960

MEDICINE

Stopped Heart Started By Inflating Lungs

WHEN A PATIENT'S HEART stops beating on the operating table it may be possible to start it beating again simply by inflating the lungs vigorously with oxygen.

Dr. Jay Jacoby of the Marquette University Medical School told a meeting of the State Medical Society of Wisconsin in Milwaukee, Wis., that for the time being doctors should continue their present resuscitation measures of opening the chest, squeezing the heart rhythmically to restore circulation, and giving artificial respiration through a tube inserted into the windpipe.

However, he said, "the whole idea of treatment for cardiac arrest, or heart stoppage, needs reevaluation."

Dr. Jacoby, formerly on the staff of the Ohio State University Medical School, said he and his colleagues there discovered accidentally that it might not be necessary to open the chest for restarting the heart when asphyxiation is the cause of cardiac arrest.

Experiments with dogs showed that pumping oxygen into the lungs could raise blood pressure, increase the oxygen content of the blood, and circulate the blood a little to bring enough freshened blood to the heart to start it beating again.

Dr. Jacoby said the circulation apparently is caused by the inflated lungs squeezing the heart and large blood vessels. He said he did not recommend the new method for use as yet, since it was still experimental.

Science News Letter, May 28, 1960

AGRICULTURE

Solar Energy Economical For Drying Grains

FIFTY PERCENT less electricity is used in drying grain by a new solar-heated-air system than by conventional systems, the U. S. Department of Agriculture reported.

The initial experiments were made by Kansas and USDA agricultural engineers. They found that even when the sun shines only 3.5 to 6.5 hours a day, grain containing up to 18% moisture can be dried.

The solar dryer has a plywood sub-floor with air space, a ventilating system and exhaust, an aluminum painted plywood panel, black corrugated sheet metal, and clear plastic. Sun-warmed air circulates down through the heating unit which is covered with clear plastic in the dryer. Air moves under, then up through the corn into the space at the peak of the dryer and is discharged. R. I. Lipper of the Kansas Agricultural Experiment Station and C. P. Davis Jr., of the Agricultural Research Station, who worked on the project, said, "because of faster drying, a solar-heated-air setup will use only about half the electricity needed for moving unheated air."

"Where in-storage drying is used, it is unlikely that any profit can be made by increasing the flow of solar-heated air above that normally recommended for unheated air systems."

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ASTRONOMY

Jupiter Back in Evening Sky

Jupiter shines brightly again, and Vega is the brightest star in the June sky. Jupiter, a cold planet, emits radio waves as does also the moon.

By JAMES STOKLEY

AFTER AN ABSENCE of several months, the planet Jupiter is on view on June evenings, shining brilliantly in the southeastern sky. So is Saturn, although considerably fainter.

Both are shown on the accompanying maps, which depict the sky as it looks about 10:00 p.m. your own kind of standard time (add one hour for daylight saving time) at the first of June, and about 9:00 p.m. in the middle of the month. Jupiter is low in the southeast, and is in the constellation of Sagittarius, the archer. No stars of this group are indicated; they are so low that absorption of their light by the air makes them too faint to be shown.

On the astronomer's brightness scale, Jupiter is of magnitude minus 2.2. Saturn, which you see a little lower and to the left, rates plus 0.4 on the magnitude scale, or a little less than a tenth as bright as Jupiter. In the position shown, so close to the horizon, Saturn is subject to considerable atmospheric absorption of its light. That is why it is marked by the symbol for a much fainter object. Later at night both planets will be much higher in the sky, however, and will shine more brilliantly.

The brightest star to be seen on June evenings is Vega, in Lyra the lyre, high in the northeast. Below it is Cygnus, the swan, in which some of the stars form a figure called the northern cross. Deneb is the brightest star in this group. And to the right of the cross, directly east, one can see Aquila, the eagle, with first-magnitude Altair (somewhat dimmed by its low altitude).

The Dipper Points

The great dipper, part of Ursa Major, the great bear, is in the north. At the bottom of the dipper are the two stars called the pointers, which show the direction to Polaris, the pole star, off to the right in Ursa Minor, the lesser bear. And if you follow the curve of the dipper's handle southward, you will come to two more first-magnitude stars: Arcturus in Bootes, the bear-driver, and Spica, in Virgo, the virgin.

To the right of Virgo, in the west, stands Leo the lion. In this is a sub-group called the sickle, with the star Regulus at the end of the handle. On the left side of Virgo you can see the rather faint constellation of Libra, the scales, and to the left of that is Scorpius, the scorpion. In it is a red star called Antares, another one that is dimmed by its nearness to the horizon.

This is also true of two first-magnitude stars that you will find near the northwestern horizon. These are Pollux, in

Gemini, the twins, and Capella, in Auriga, the charioteer. They are all that remain visible of the brilliant stars of the winter evening sky.

Jupiter and Saturn are two of the five planets that may be visible to the naked eye. As for the others, Mercury will be farthest east of the sun on June 19, and for a few days about then you may be able to see it low in the west soon after sunset.

Venus will be behind the sun on the 22nd, and cannot be seen at all in June. Mars comes up in the east about three hours before the sun, and during the month moves from Pisces, the fishes, into Aries, the ram.

On June 19 Jupiter will be opposite the sun, rising at sunset and setting at sunrise; thus it will be visible all night. Saturn rises about an hour after sunset, and is visible the rest of the night.

When you look at Jupiter you not only see a bright planet: you are also viewing a powerful radio transmitter.

For Jupiter, as many objects in the sky do, is sending out radio waves. For many years astronomers have known how to detect them. From their studies have come a vast amount of new knowledge of the universe.

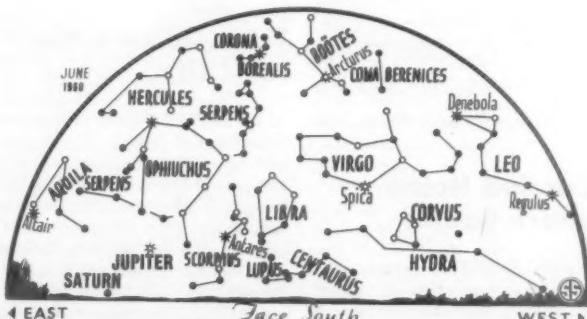
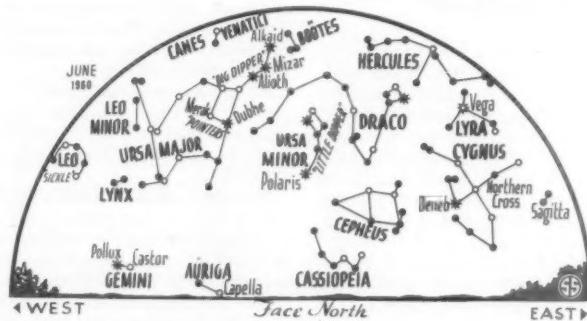
Jupiter is a cold planet, but even objects considered to be cold have atoms in rapid motion, which are also emitting radiation. This radiation is in waves similar to those of visible light, but considerably longer— infrared waves, or red waves of longer wavelength than the longest the eye can detect. The longest infrared waves overlap into the shortest radio waves. An object of any temperature above absolute zero, minus 459.7 degrees Fahrenheit, will produce detectable heat radiation.

Radio waves, about half an inch in length, have been picked up from such a "cold" object as the moon, but with an important difference.

Radio "Light" of the Moon

In visible light, the moon is brightest when it is full, that is, when the sun is shining on it from behind us and the entire sunlit hemisphere is turned toward us. But in radio "light" the moon is brightest about four days after it is in the full phase. Apparently the radio waves come from a region a foot or so beneath the surface and it takes that long for the heat to be conducted to that depth. The moon seems to be covered with something that is a good insulator for heat.

Jupiter is even colder than the moon, as well as being farther away, but very feeble radio waves of this sort have been detected from it. In 1955 two scientists at the Department of Terrestrial Magnetism of the



* * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Carnegie Institution in Washington picked up a far more powerful radio transmission from this planet. Its wavelength is about 50 feet and in many ways it resembles the radio static produced by lightning flashes.

Could it be that there are huge electrical storms on Jupiter, which produce static so powerful that its effect is felt on earth, an average of some half a billion miles away? This is one theory, but the radio bursts from Jupiter seem to have about a hundred trillion times the power of the average terrestrial lightning stroke, and they last as much as a second, while our strokes are but a few thousandths of a second long.

The planet Jupiter is very different from earth. It is about 87,000 miles in diameter. At the center, it seems, there is a rocky core. Around this there is a layer of ice, and over that an atmosphere of hydrogen, methane and ammonia several thousand miles thick.

The pressure is so great that this "atmosphere" is, on the average, about a third as dense as water. In it there must be great clouds of electrically charged gases, and as these interact with each other they produce the radio waves which signal to us their presence.

Celestial Timetable for June

JUNE EST		
2	11:02 a.m.	Moon in first quarter
	8:02 a.m.	Full moon
9	9:00 p.m.	Moon nearest, distance 222,100 miles
10	2:00 a.m.	Moon passes north of Jupiter
11	5:00 a.m.	Moon passes north of Saturn
13	11:36 p.m.	Moon in last quarter
18	2:00 p.m.	Moon passes south of Mars
19	9:00 a.m.	Mercury farthest east of sun, visible for a few days around this time in west just after sunset
	9:00 p.m.	Jupiter in opposite direction from sun and nearest earth; distance 393,800,000 miles
21	4:43 a.m.	Sun farthest north, summer commences in Northern Hemisphere (winter begins in Southern Hemisphere)
22	11:00 a.m.	Venus behind sun
23	10:27 p.m.	New moon
24	5:00 a.m.	Moon farthest, distance 252,700 miles
26	4:00 a.m.	Moon passes south of Mercury
		Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, May 28, 1960

AERONAUTICS

New Solar Cells Made: No Batteries Needed

A SOLAR CELL that serves as its own storage battery was reported to engineers attending a Society of Automotive Engineers aeronautics meeting in New York.

If it fulfills its apparent promise, the cell will make obsolete solar cells now powering American satellites. These older cells require heavy storage batteries to store the electricity converted from sunlight.

The new cells convert solar energy directly to chemical energy. The cells themselves store the chemical energy for later conversion to electrical energy. Bert H. Clampitt and Dale E. German of the Wichita, Kans., division of the Boeing Airplane Company built the experimental cells.

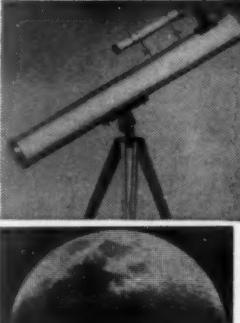
Science News Letter, May 28, 1960

GET READY FOR THE SPACE AND SCIENCE ERA! SEE SATELLITES, MOON ROCKETS CLOSE-UP

AMAZING SCIENCE BUYS for FUN, STUDY or PROFIT



See the Stars, Moon, Planets Close Up!



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fascinating photos of moon!

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PSYCHIATRY

Treated Separately

Husband and wife treated for marriage difficulties both showed emotional disturbances from childhood. Monotony is the greatest strain for men in isolation.

THE EXPERIENCES of a psychiatrist in trying to help married couples whose marriages had gone on the rocks after ten years or more was reported to the American Psychiatric Association meeting in Atlantic City, N. J., by Dr. Selwyn Brody, chief of psychiatry at Children's Village, Dobbs Ferry, N. Y.

Although both husband and wife were treated separately, it was planned to have joint sessions later to consolidate results.

The patients were between 35 and 50 years of age and all have two or more children. All were college graduates, business and professional people.

The couples, Dr. Brody said, were dominated by a need to hate and make life miserable for each other. They do not show any affection toward one another and sexuality, of course, is "dismally unsatisfactory." Their only form of communication is likely to be their bone of contention—the imminence of divorce.

Each individual suffered from severe emotional disturbances dating from childhood, yet none had sought psychiatric help before their marriages. The emotional disturbances, he said, helped to disrupt the marriages, but the bad marriage situations also contributed to the individual breakdowns.

The psychiatrist trying to help such unhappy people has a three-level responsibility. He must be on the side of each individual and on the side of the marriage. He must build up a separate relationship with each partner in the marriage in order to maintain simultaneous treatment and if possible save the marriage.

Naturally, he is beset by feelings of uncertainty but at last he is in a position to help both partners to resolve their conflicts.

Science News Letter, May 28, 1960

Sameness Strains Men

IT IS NOT THE COLD, the danger or the hardship that puts a strain on men stationed in Antarctic posts for a year, Capt. Charles Samuel Mullin Jr., of the U. S. Navy Medical Corps stationed at the U. S. Naval Hospital in Philadelphia, told the American Psychiatric Association meeting in Atlantic City, N. J.

Three things contribute to the unusual stress experienced, he said. The most important is the difficulty of getting along in the "tight little society" in which he is placed.

Each man soon learns that he is entirely dependent upon the next man and on the group. Fights are very rare, but headaches are extraordinarily common.

The inner tensions due to swallowed anger also contribute to insomnia.

The second stress is the sameness encountered by the men—the same few faces, the same surroundings, the same relatively simple routine of life and the long periods of enforced physical inactivity.

The third stress is the absence of family and loved ones and of the familiar pleasures of the man's "personal civilization." As might be expected, Capt. Mullin said, the men try to make up for the other deprivations by the enjoyment of food. Appetite and consumption are enormous, he reported.

Sex deprivation does not seem to be an important problem to the men except in rare instances during periods of personal emotional upset.

Despite these difficulties, Capt. Mullin said that a group's morale is generally of a high order and so also is the group's effectiveness in the discharge of its functions. In fact, the men who spend the winter in remote stations feel that something worthwhile has happened to their personalities.

Science News Letter, May 28, 1960

Use Relative for Therapy

"SPECTACULAR RECOVERY" of mental patients when the psychiatrist never saw a patient alone but spent his time with a close relative of the patient was described to the American Psychiatric Association meeting in Atlantic City, N. J., by Drs. Rodolph H. Turcotte and Willis H. Ploof of the Kingsport Mental Health Center, Kingsport, Tenn.

By working entirely through the husband, wife, parent or child of the patient, the psychiatrist was able to apply "therapeutic leverage" that proved to be more effective than direct treatment of the patient would have been.

Some of the patients showed dramatic improvement in weeks or even in days, the psychiatrists reported. They believe that this method represents a major advance.

Science News Letter, May 28, 1960

Gambler Driven to Lose

THE COMPULSIVE gambler has a compulsion not just to gamble but to lose, Dr. Iago Galdston of the New York Academy of Medicine, New York City, told the American Psychiatric Association meeting in Atlantic City, N. J.

The compulsive gambler cannot quit when he is ahead—he must keep on playing until he loses.

The need to lose applies in affairs of the heart as well as in wooing Lady Luck, Dr. Galdston reported.

He described the case of a gambler who was treated for his compulsive gambling.

He came back to the psychiatrist five years later.

In the meantime he had become involved with a woman who loved him very much and during the time of the affair he gave up gambling. He was not satisfied with her love, however—he actually tried to lose her. He arranged with a friend to try to take the woman away from him during the gambler's absence from the city. When he got back the friend told him that the woman had been faithful and had resisted all the friend's advances.

After that, the gambler not only doubted his sweetheart but also doubted the sincerity of his friend. He resumed gambling.

Science News Letter, May 28, 1960

PSYCHIATRY

Anti-Depressant Drug Cures Three Out of Four

A DRUG that brings patients out of depression, resulting in three out of four cured within a year, is a new weapon in the war against mental illness.

Development of the drug, Deprol, was called "a major step in the scientific conquest of mental depression" by Dr. Prodromos N. Papas, professor emeritus at Tufts University Medical School and visiting physician at Massachusetts General Hospital.

In more than two years of clinical tests involving hundreds of patients, Deprol proved 76.5% effective, Dr. Papas told the Conference on Mental Depression in Waltham, Mass. He said the drug acts swiftly, producing results within a few days, without harmful side effects. In most cases of depression, Deprol, manufactured by Wallace Laboratories, eliminates the need for electroshock and other therapy.

Tension and depression are the two leading forms of mental illness. Depression, which strikes six out of 10 U. S. families, is more serious. Since 1955, tranquilizers have been used to control tension.

Deprol "could be as revolutionary in the conquest of depression as the tranquilizers have been in treating tension states."

Because anti-depressant drugs work quickly, can be administered by a family physician without the aid of a psychiatrist, and allow mental hospitals to release patients much sooner, taxpayers have been relieved of some of the expense of public care of the mentally ill.

The average good mental hospital, said Dr. William F. McLaughlin, superintendent of the Metropolitan State Hospital in Waltham, now releases 80% of its patients within a year's time.

After patients had shown such great improvement with drug therapy, Dr. McLaughlin said, hospitals began to relax some of their rigid regulations. Bars came off windows, old wooden chairs were replaced with metal upholstered ones, ward rooms were painted in cheerful colors and some hospitals did away with so many locked doors they are now known as "open hospitals."

Science News Letter, May 28, 1960

Science Fair Winners

(Continued from page 342)

tion of Fluorescence in Relation to the Porphyrins." Alternate Awards of inscribed plaques were given to Junko Sugimori, 18, Aisen H.S., Sakaishi, Osakafu, Japan, and to Martin J. Murphy, Jr., 17, Abbey School, Canon City, Colo. Suitably inscribed certificates recognized each winner's sponsoring teacher and the winners were given subscriptions to the Journal of Chemical Education.

The Society of American Bacteriologists gave its First Award to Barry Ronald Dworkin, 16, Amundsen Sr. H.S., Chicago, Ill., for "The Mitotic Sensitivity of *E. coli*." He won an engraved plaque, certificate of merit, and \$125 to further his career in science. Second Award went to Mary Sue Wilson, 16, Malcolm Price Laboratory School, Cedar Falls, Iowa, for "Mutational Origin of Bacterial Resistance to Antibiotics." She received an engraved plaque, certificate of merit, and \$75. Winners' schools also get engraved plaques. Honorable Mentions named: Robert Herman Baum, 18, Melbourne H.S., Melbourne, Fla.; J. Steve Smith, 17, Northeast H.S., Oklahoma City, Okla.; Marilyn Pui-lin Yee, 16, Punahoa Academy, Honolulu, Hawaii.

The Indiana Heart Association gave its Award of \$100 Government Bond to Barry G. Vesper, 16, College H.S., Bartlesville, Okla., for "Effect of Positive G Forces on Pulse and Respiration of the Rat."

The Indiana Pest Control Operators Association presented a First Award to Harriet Lynn Pryor, 17, Colton Union H.S., Colton, Calif., for "Microscopic Study of Roach for Hansen Bacilli." A Second Award went to Edward Fontaine Colston, 16, Martinsville H.S., Martinsville, Va., for "A Study of the Body Fluids of the Common Cockroach." The awards were \$75 and \$25 for the purchase of scientific materials.

Science News Letter, May 28, 1960

Do You Know

True hibernation involves a drop in body temperature to within a few degrees of the surroundings; breathing and heartbeat become very slow and irregular.

The longest drought in U.S. history was in Bagdad, Calif., where no measurable rain fell between Oct. 3, 1912, and Nov. 8, 1914—767 days.

Questions

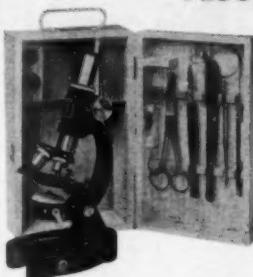
ANTHROPOLOGY—Who were the two groups of people in ancient Greece having good teeth? p. 339.

ASTROPHYSICS—How far above the surface is Jupiter's radiation belt located? p. 338.

MEDICINE—What method was used for pinpointing clots in blood vessels? p. 344.

Photographs: Cover, Science Service; p. 339, the National Society for Crippled Children and Adults; p. 341, p. 342 and p. 343, Science Service; p. 352, Damar's.

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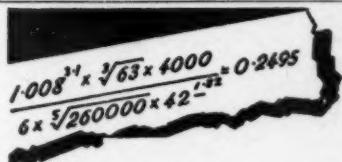
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New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D.C., and ask for Gadget Bulletin 1041. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

UNDERWATER COMMUNICATIONS SYSTEM permits an amateur diver to talk to others within a radius of 150 feet. The diver simply speaks into a mask microphone. An amplifier on the diver's air tank radiates the magnified sound waves through the water. Other divers need no receivers to hear the sounds. The system operates in water up to 120 feet in depth.

Science News Letter, May 28, 1960

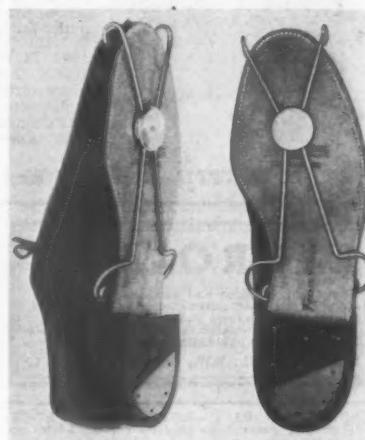
TILT GAME tests skill and dexterity. Player must tilt the game's triangular plastic tray by two levers so that a marble rolls from start position to finish without falling through holes in the tray. Baffles bounce the ball, as in a pin-ball machine.

Science News Letter, May 28, 1960

PHONY DENTIST KIT, just for fun, includes forceps and drill. A hidden tooth pops up when forceps are opened. Drill hums and vibrates but does not actually drill, of course. Both tools are made of chrome finished plastic.

Science News Letter, May 28, 1960

OUTSIDE SHOE TREES, shown in the photograph, clip onto the bottoms of soles. Made of chrome finished spring steel rod, the trees prevent soles from curling and



keep shoes shapely. Because they do not fit inside the shoes, the trees permit the shoes to air and dry.

Science News Letter, May 28, 1960

RADIO HAM'S GLOBE, designed for amateur radio operators and shortwave listeners, features indicating devices that show the direction in degrees and distance

in miles of any country from the user's location. This feature is particularly useful to amateurs with rotary antennas. The colorful world globe also includes a disk that indicates the time anywhere in the world. Amateur call letter prefixes are shown on each country.

Science News Letter, May 28, 1960

AUTOGRAPHED LEAD PENCIL has a smooth white panel on which you can write your name or a message with pen or pencil. With name inscribed, pencils may not "walk away" so often.

Science News Letter, May 28, 1960

CELESTIAL JIG-SAW PUZZLE, when fitted together, makes a cardboard map of the stars. Stars are shown in white; constellation shapes and mythological figures are drawn in green. The puzzle is designed for youngsters in grades three to eight.

Science News Letter, May 28, 1960

FRICTION DOOR HOLDER, easily installed on door hinge, is designed to hold the door in any position, preventing it from opening or closing by itself or from a breeze. Part of the bronze holder rubs against the hinge to retard the swing of the door.

Science News Letter, May 28, 1960

Nature Ramblings

SOMETIME between May and October, the poison ivy season will hit most parts of North America. During this season most of the 500,000 to 1,000,000 people who are expected to fall victim to this major public health hazard this year will develop an irritating skin rash, whose extent and severity will vary considerably with the individual.

Poison ivy, and closely related poison oak, is prevalent in 47 states and Canada. It is rare or non-existent in the extreme southwestern United States and is not known to exist in other parts of the world. Known as *Rhus radicans* to botanists, common poison ivy grows as a woody vine, as trailing shrubs or as erect woody shrubs without support.

There are as many as 18 varieties of poison ivy leaves, depending on exposure to sunlight, rain and other weather conditions. About the only thing about the plant that is constant is that its leaves always grow in groups of three. Leaf edges

Poison Ivy



may be quite smooth or notched, and their color is green throughout spring and summer but scarlet and russet in early fall.

Poison ivy flowers are small and white and grow in clusters from the side of the stem above the leaf. The fruit is white or creamy and usually wax-like, but may have a downy look. They have distinctive lines like a peeled orange.

Poison ivy may be caught by sensitive individuals by direct exposure by contact

with the leaves, berries, stem or roots. Most investigators, however, believe that contact is dangerous only when these parts are broken or bruised, because only then is the urushiol oil, which causes the infection, released.

It is important to note, however, that the danger of contracting a skin rash from poison ivy exists the year round. For the urushiol oil may reach its victims in many different ways, such as through smoke from a fire in which parts of the plant may be burning and by contact with clothes that have been contaminated with the long potent urushiol oil.

Sensitivity to poison ivy is acquired by repeated exposures. A young infant, unless specifically allergic, is not sensitive. Allergists believe about 20% of the population are naturally immune to the toxic plant but warn that people who claim to be immune really may not be; they may merely be "underexposed."

Science News Letter, May 28, 1960